

**UNITED STATES  
DEPARTMENT OF LABOR  
MINE SAFETY AND HEALTH ADMINISTRATION  
Metal and Nonmetal Mine Safety and Health**

**REPORT OF INVESTIGATION**

**Surface Nonmetal Mine  
(Limestone)**

**Fatal Falling Material Accident**

**June 12, 2006**

**Rockbridge Stone Products, Inc.  
01 Mine  
Glasgow, Rockbridge County, Virginia  
Mine I.D. No. 44-00067**

**Investigators**

**John B. Felichko  
Mine Safety and Health Inspector**

**Thomas J. Shilling  
Mine Safety and Health Inspector**

**Richard A. Skrabak  
Mechanical Engineer**

**Michael E. Pruitt  
Mine Safety and Health Specialist**

**Originating Office  
Mine Safety and Health Administration  
Northeast District  
Thorn Hill Industrial Park  
547 Keystone Drive, Suite 400  
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James R. Petrie, District Manager**



## **OVERVIEW**

Gary W. Hostetter, machine/plant operator, age 39, was fatally injured on June 12, 2006, while starting to repair a hydraulic line on a front-end loader that was parked outside of the shop. He was underneath the raised boom, loosening a hydraulic connection, when the boom arms fell, pinning him against the frame.

The accident occurred because there were no procedures in place to block the raised components of the front-end loader against hazardous motion to protect persons performing maintenance tasks. The victim was not provided any task training prior to repairing a hydraulic line on the front-end loader.

## **GENERAL INFORMATION**

The 01 Mine, a surface multi-bench quarry, owned and operated by Rockbridge Stone Products, Inc., was located in Glasgow, Rockbridge County, Virginia. The principal operating official was James E. Coffey, vice president. The mine normally operated one 11-hour shift, five days per week. Total employment was ten persons.

Limestone was blasted from multiple benches and transported by front-end loaders and haul trucks to the crushing plant where it was broken and separated into various sized materials. Finished products were sold as construction aggregate.

The last regular inspection at this operation was completed on February 28, 2006.

## **DESCRIPTION OF ACCIDENT**

On the day of the accident, Gary W. Hostetter (victim) reported to work at 5:30 a.m., his normal starting time. Timothy Galford, superintendent, assigned Hostetter to work with Alvin Sensabaugh, production foreman. They were to repair a hydraulic leak on a front-end loader. Alvin Sensabaugh arrived at 6:40 a.m. and observed the loader parked in front of the shop with the bucket raised. He went into the break room, where the employees had assembled, and met with Jeffery Kulp, welder.

Both men went outside to the loader and walked under the unblocked, raised bucket assembly where Alvin Sensabaugh showed Kulp which hydraulic line needed removed. The two men were walking away from the loader when Hostetter asked Kulp to be shown which hydraulic line was leaking because he wanted to start removing the line. Kulp took Hostetter to the loader to show him which line was leaking. After meeting with Galford, Alvin Sensabaugh told Kulp to go to the quarry because the breaker plates in the crusher needed to be flipped. Kulp gave Hostetter tools so he could remove the hydraulic line. Kulp and Alvin Sensabaugh then went to the quarry.

About 7:00 a.m., the other employees left the break room to perform their normal duties. Anthony Sensabaugh, machine/plant operator, was in the shop and had just finished talking with Michael Cox, track-hoe operator, and Darrell Bane, haul truck driver. He heard the sound of fluid hitting the ground and turned to see the front-end loader's bucket fall to the ground. Bane asked if anyone was under the bucket and Anthony Sensabaugh replied that Hostetter was there. Anthony Sensabaugh and Bane ran to the loader calling for Hostetter, but there was no response. Anthony Sensabaugh asked Cox to raise the bucket, but Cox didn't think it would raise, so they called for emergency medical assistance.

Anthony Sensabaugh told Alvin Sensabaugh and Galford of the accident. They rushed to the scene and saw that Cox was able to curl the loader bucket up enough to free Hostetter. At 7:23 a.m., the first emergency crew arrived at the shop and found Hostetter non-responsive. Hostetter was pronounced dead at the scene by the responding emergency medical personnel. The cause of death was attributed to crushing injuries.

## **INVESTIGATION OF THE ACCIDENT**

MSHA was notified of the accident at 7:40 a.m. on June 12, 2006, by a telephone call from Susan Coffey, office manager, to Dale St. Laurent, supervisory mine safety and health inspector. An investigation was started that day. An order was issued under the provisions of Section 103(k) of the Mine Act to ensure the safety of miners. MSHA's accident investigation team traveled to the mine, made a physical inspection of the accident scene, interviewed employees, and reviewed documents and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management, employees, and personnel from the Virginia Department of Mines, Minerals and Energy's Division of Mineral Mining.

## **DISCUSSION**

### **Location of the Accident**

The accident occurred near the onsite maintenance shop. The weather was cloudy and cool with a temperature of 65° Fahrenheit. There had been significant rainfall the night before the accident.

### **Front-End Loader**

The front-end loader that was involved in the accident was a 1999 Volvo Model L150C wheel loader, powered by a Volvo Model TD103KCE diesel engine. The operating weight of the loader was approximately 23,000 pounds. It had a bucket lifting frame that weighed more than 5,000 pounds and was moved by two double-acting cylinders, one on each side of the machine. The front-end loader was equipped with a servo assisted (pilot operated) open center type hydraulic system with a working pressure of approximately 3,000 psi.

A lift control lever raised and lowered the bucket on the front-end loader. A bucket tilt lever controlled the bucket tilt position. Both of these levers were located on the right side console in the operator's cab. The lift lever had four positions: lifting, neutral, lowering, and floating. When the lifting control lever was moved, it sent a signal to position a five-way four position hydraulic valve. When the control lever was applied, this valve allowed hydraulic oil to move the two lifting cylinders to raise or lower the bucket.

The victim was attempting to remove a steel hydraulic line. This line was part of the feed line that went to the cap end of the left lift cylinder. One end of the line was connected to the five-way four position hydraulic valve via a four bolt O-ring flange. At the time of the accident, the victim had completely removed three of the four Allen head screws holding this connection. The fourth screw was found loose and not quite "hand tight." The other end of the hydraulic line was connected to a hose assembly by a four bolt O-ring flange. The four hexagon screws holding this connection were still tight at the time of the accident. This hose assembly went directly to the cap end of the left lift cylinder.

The bucket lift function operated as designed. When the bucket was raised and the machine was turned off, hydraulic pressure in the lift cylinder feed lines kept the bucket raised. When the victim broke the seal of the hydraulic feed line, pressure to the lift cylinders was released and the bucket immediately dropped. The hydraulic system was found to function as designed.

### **Simulated Test**

A simulated test was performed to determine the effect of the release of the lift cylinders on the raised bucket of the front-end loader. The bucket was raised, the engine was turned off, and the lift control lever was moved to allow oil to release from the lift cylinders. In this simulation, the bucket fell to the ground in less than three seconds. However, this simulation did not completely depict the accident since the hydraulic pressure could not release as fast as it did during the accident because of line restrictions. In the accident, the bucket would have dropped much faster and would not have given the victim any time to react.

### **Volvo Service Manual**

Mine management was unable to provide a service manual for the machine. A local authorized Volvo dealer provided a copy of a service manual for the investigators. Section 9 of the manual covered repairs to the hydraulic system. This section included drawings of tools (referred to as E-tools) which could be made for use during hydraulic repairs. One of these tools was a lifting frame support (referred to as E-1370). This support was designed to secure the lifting frame. The manual specified: "Always use a support to secure the lifting frame when work is carried out under the lifting frame" and referred to a figure showing Support E-1370.

### **Training and Experience**

Gary W. Hostetter had 1 year and 10 weeks of mining experience, all at this mine. He had received annual refresher training in accordance with 30 CFR, Part 46; however, he had not received the required task training in accordance with 30 CFR, Part 46.7(a).

## **ROOT CAUSE ANALYSIS**

A root cause analysis was conducted and the following root causes were identified:

**Root Cause:** A risk assessment to determine all possible hazards and to establish safe work procedures was not conducted prior to repairing a hydraulic line on a front-end loader. No procedures were in place to ensure that persons could safely perform maintenance tasks on mobile equipment. The raised components of the front-end loader were not blocked to prevent hazardous motion.

**Corrective Actions:** Procedures should be established that require a risk assessment be conducted to identify and correct potential hazards associated with the task to be performed. Safe maintenance procedures should be developed and implemented that ensure components

are blocked against hazardous motion according to the manufacturer's recommendations prior to performing maintenance tasks on mobile equipment.

Root Cause: Standards and controls were inadequate and failed to ensure that training regarding maintenance on mobile equipment was provided to persons before performing the task.

Corrective Actions: Procedures should be established to ensure that all persons receive training to safely perform maintenance tasks on mobile equipment.

## CONCLUSION

The accident occurred because there were no procedures in place to block the raised components of the front-end loader against hazardous motion to protect persons performing maintenance tasks. The victim was not provided any task training prior to repairing a hydraulic line on the front-end loader.

## ENFORCEMENT ACTIONS

**Order No. 6039751** was issued on June 12, 2006, under the provisions of Section 103(k) of the Mine Act:

A fatal accident occurred at this operation on June 12, 2006, when the loader operator was crushed between the lifting arms and the frame of the Volvo L150C front-end loader when the loader bucket fell. This order is issued to assure the safety of persons at this operation and prohibits any work in the affected area until MSHA determines that it is safe to resume normal operations as determined by an Authorized Representative of the Secretary of Labor. The mine operator shall obtain approval from an Authorized Representative for all actions to recover and/ or restore operations in the affected area.

The order was terminated June 14, 2006. Conditions that contributed to the accident no longer exist and normal operations can resume.

**Citation No. 6036884** was issued on June 26, 2006, under the provisions of Section 104(d)(1) of the Mine Act for a violation of 30 CFR 56.14105:

A fatal accident occurred at this operation on June 12, 2006, when a machine/plant operator was pinned between the bucket assembly and frame of a front-end loader. The victim was working underneath the raised bucket assembly and, as he unbolted the flange holding a hydraulic line in place, the system lost hydraulic fluid/pressure which caused the bucket assembly to suddenly drop. The bucket assembly was not blocked to prevent accidental lowering. A plant foreman had walked underneath the unblocked bucket assembly prior to the accident to point out where the leak was. Failure to ensure that the raised bucket assembly was blocked or mechanically secured to prevent accidentally lowering constituted more than ordinary negligence and was an unwarrantable failure to comply with a mandatory standard.

This citation was terminated on June 27, 2006. The mine operator developed a written policy for safe procedures to be followed while making repairs on mobile equipment. All persons were given safety training which included blocking equipment with raised components.

**Order No. 6036885** was issued on June 26, 2006, under the provisions of Section 104(d)(1) of the Mine Act for a violation of 30 CFR 46.7(a):

A fatal accident occurred at this operation on June 12, 2006, when a machine/plant operator was pinned between the bucket assembly and frame of a front-end loader. The victim was working underneath the raised bucket assembly and, as he unbolted the flange holding a hydraulic line in place, the system lost hydraulic fluid/pressure which caused the bucket assembly to suddenly drop. The bucket assembly was not blocked to prevent accidental lowering. The victim did not have any previous experience performing such repairs, and he had not been provided with new task training. Failure to provide new task training that included the health and safety aspects and safe work procedures specific to the new task constitutes more than ordinary negligence and was an unwarrantable failure to comply with a mandatory standard.

This order was terminated on June 27, 2006. The mine operator developed a written policy stating that no new task shall be performed until the persons performing the task have been properly trained. The policy was reviewed with all mine employees.

Approved: \_\_\_\_\_  
James R. Petrie  
District Manager

Date: \_\_\_\_\_



## **APPENDIX A**

### **Persons participating in the investigation**

#### **Rockbridge Stone Products Inc.**

James E. Coffey	vice president
Timothy O. Galford	superintendent
Alvin L. Sensabaugh	production superintendent
Anthony L. Sensabaugh	machine/plant operator
Jeffery L. Kulp	welder
Michael W. Cox	track-hoe operator
Darrell T. Bane	haul truck driver

#### **Virginia Department of Mines, Minerals and Energy's Division of Mineral Mining**

Gary E. Barney	supervisor
James E. Smith	mine inspector

#### **Mine Safety and Health Administration**

John B. Felichko	mine safety and health inspector
Thomas J. Shilling	mine safety and health inspector
Richard A. Skrabak	mechanical engineer
Michael E. Pruitt	mine safety and health specialist